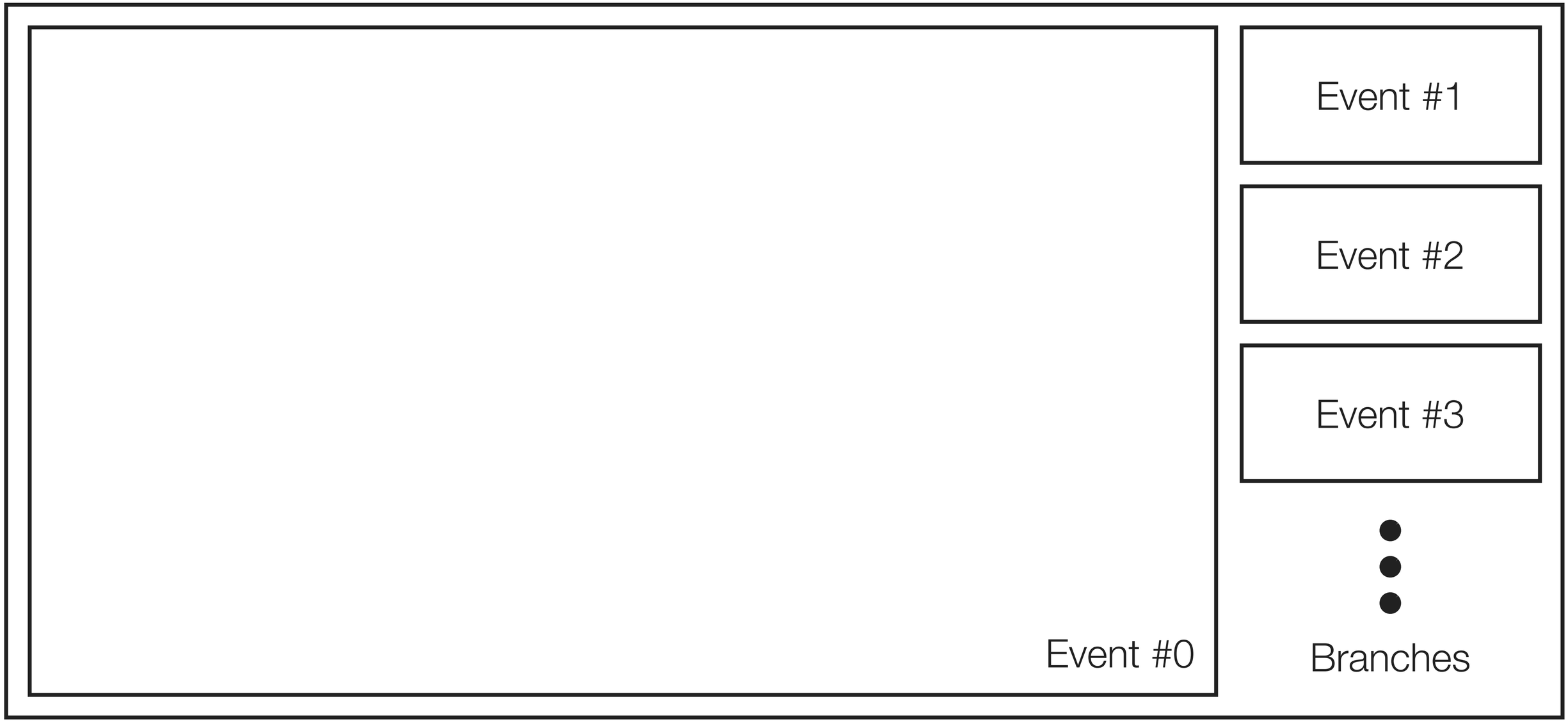
TPC Simulation

JungWoo Lee

Group Meeting, 2013.8.9

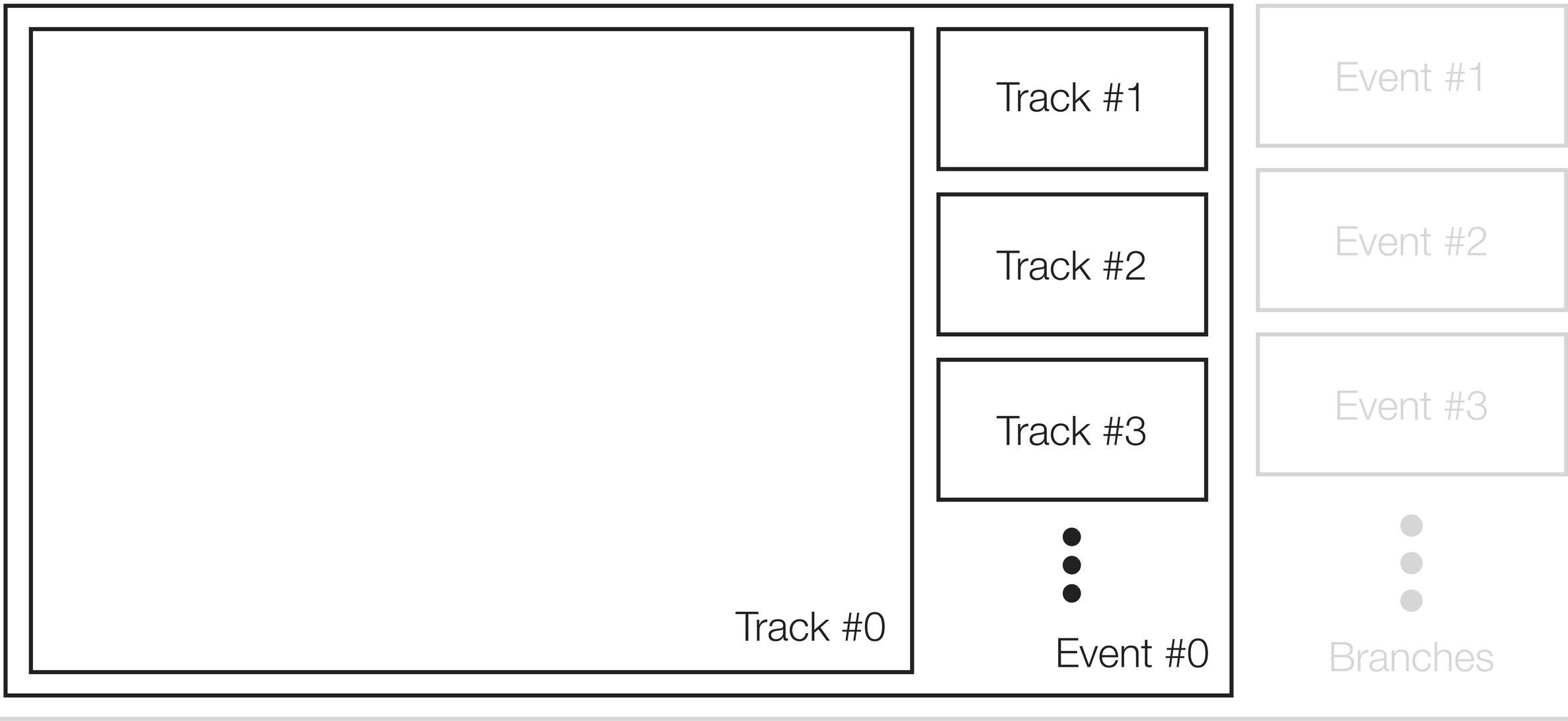
Digitized data

digitizedData.root



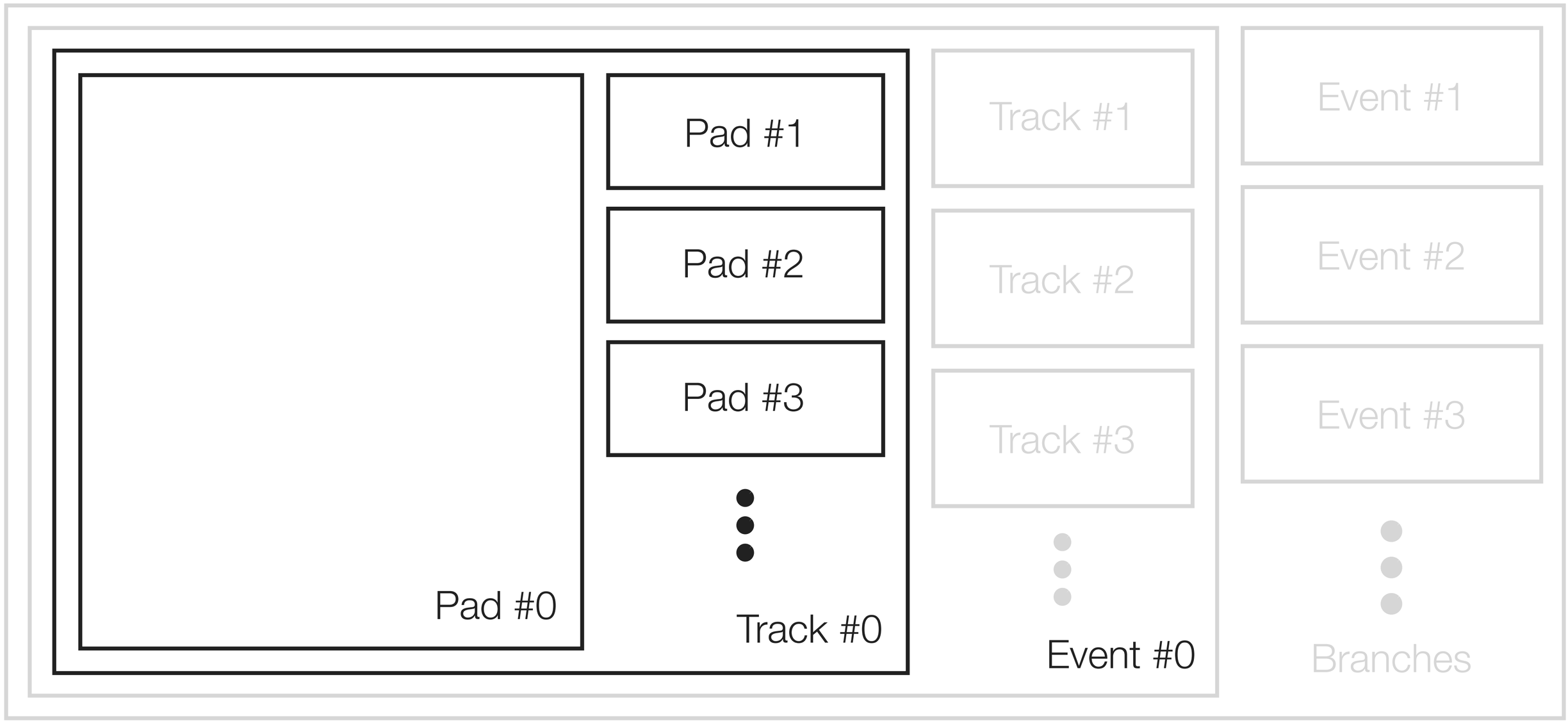
Digitized data

digitizedData.root



Digitized data

digitizedData.root



Digitized data

digitizedData.root

Position

Charge

Time

Pad #0

Pad #1

Pad #2

Pad #3

Track #0

Track #1

Track #2

Track #3

Event #0

Event #1

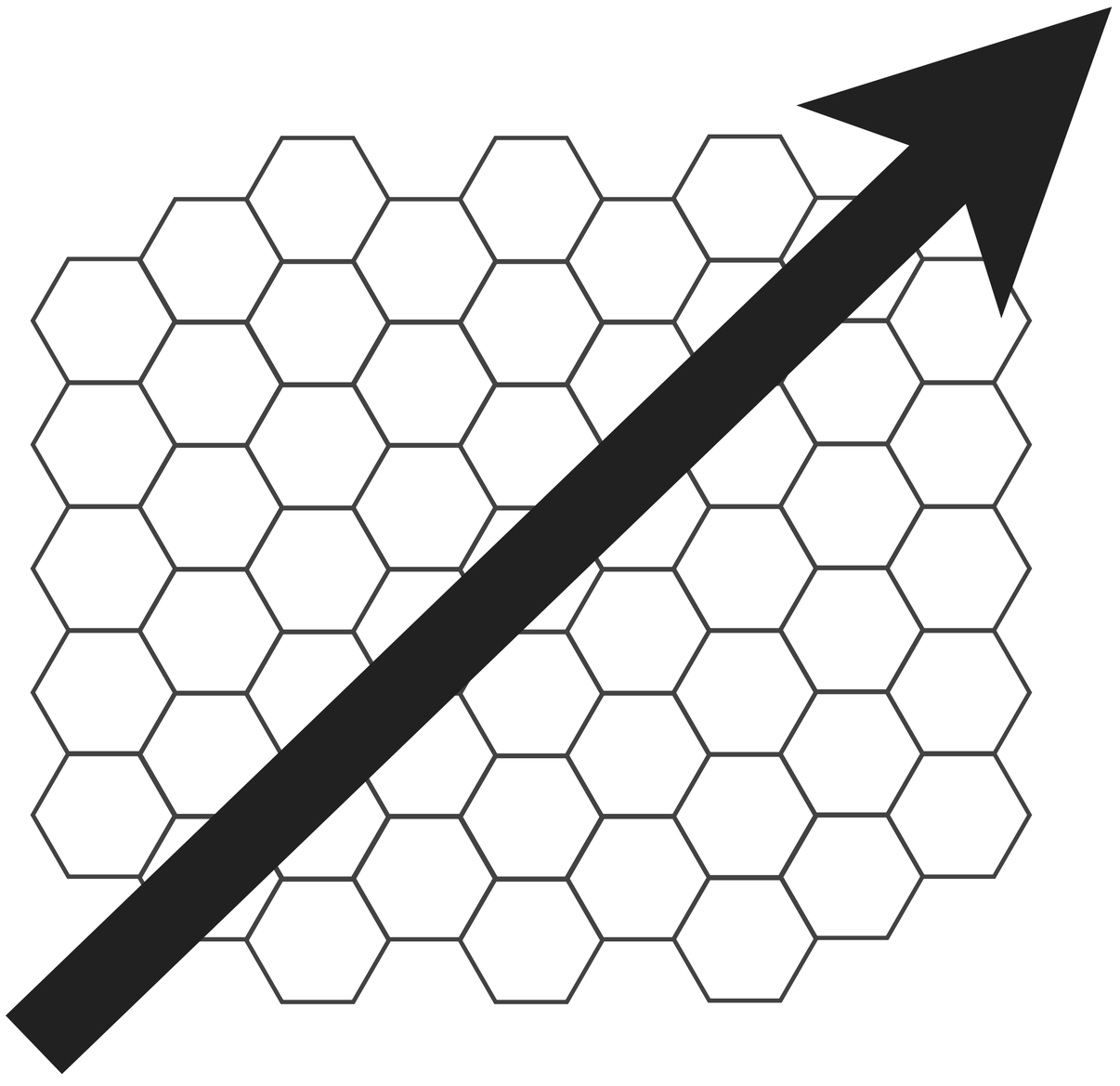
Event #2

Event #3

Branches

Clustering

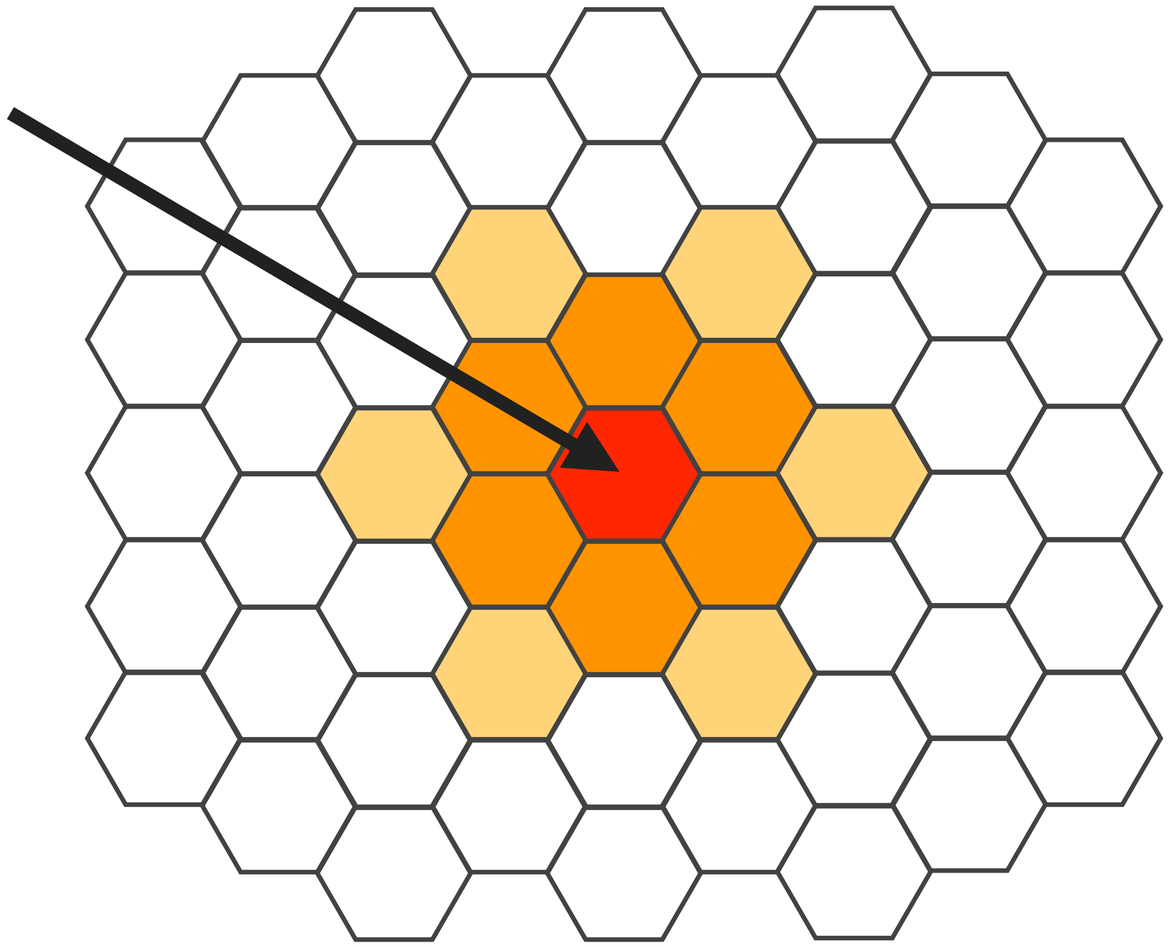
2D example



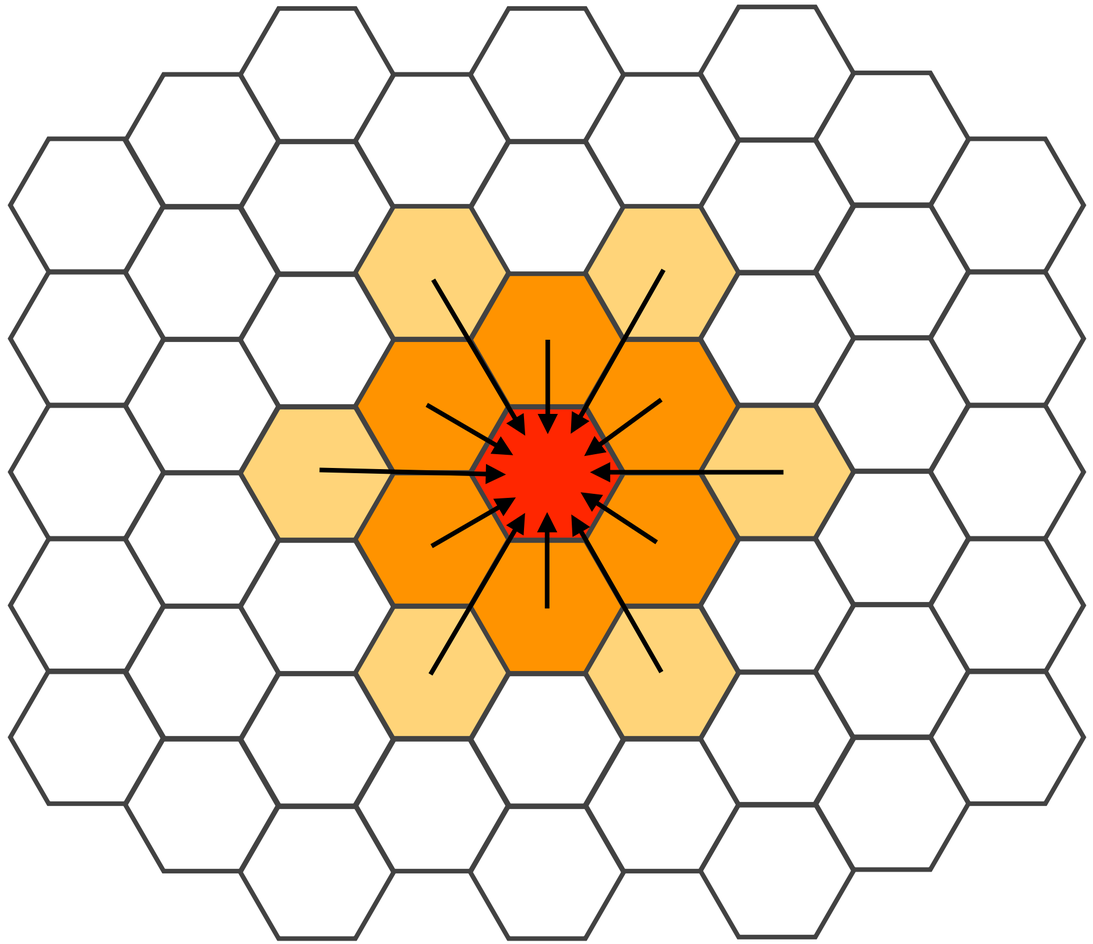
Track

Clustering

Maximum!

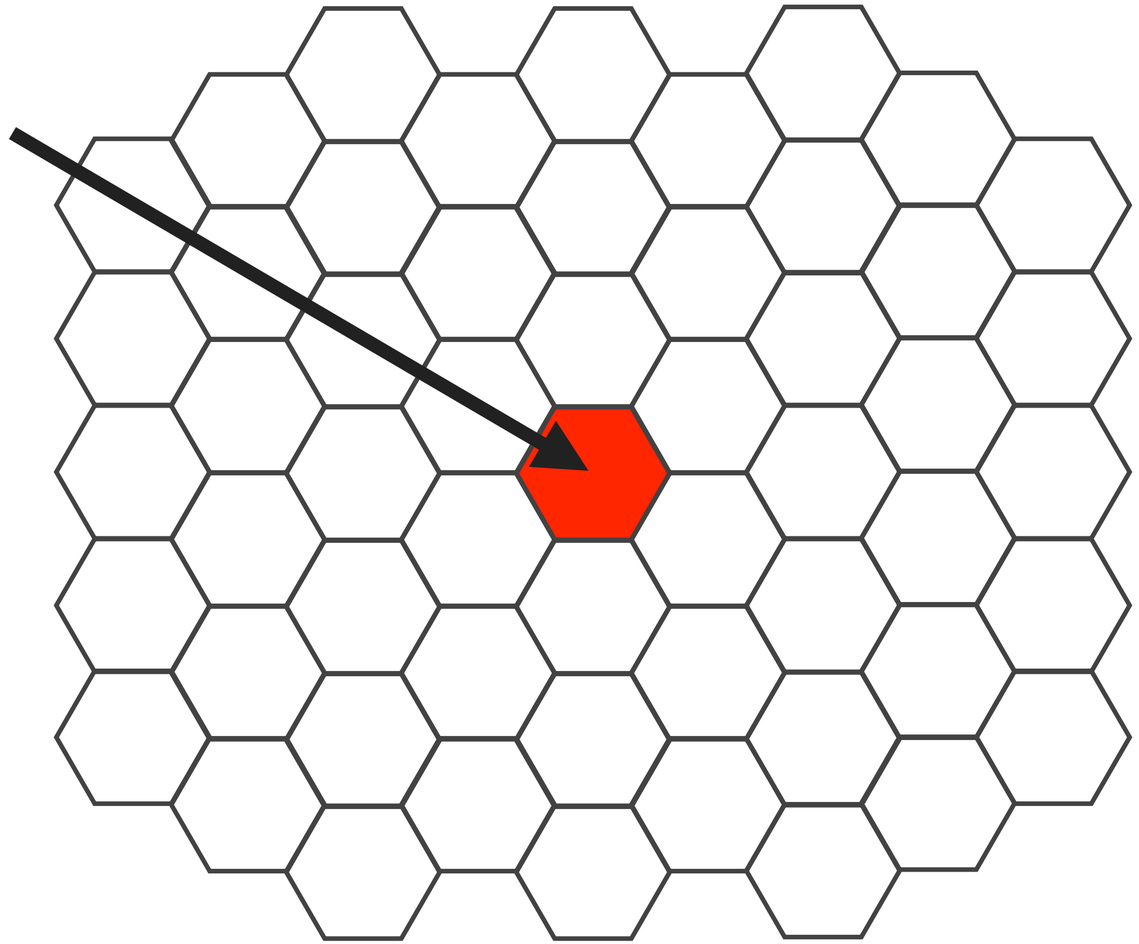


Clustering

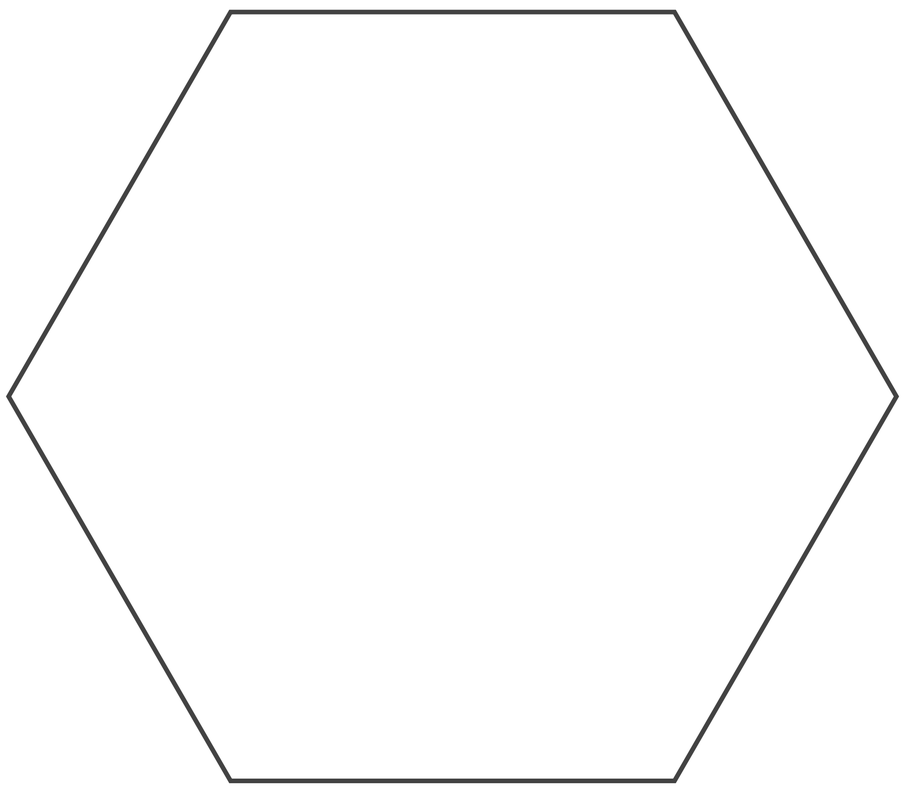


Clustering

Center of charge



Pad mapping



Pad

1. Geometrical pad position

: (x, y)

2. Global bin number

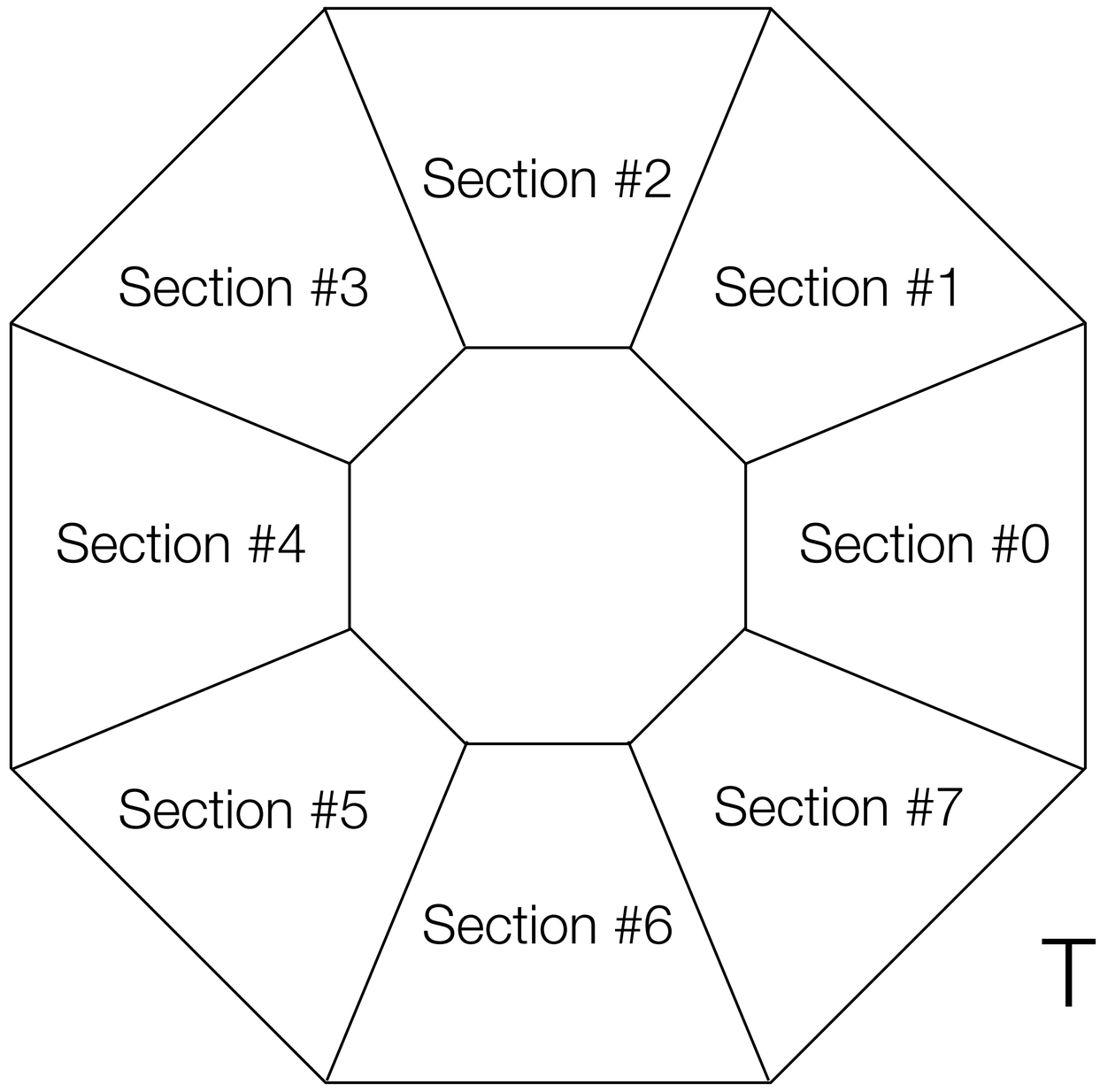
: Given when creating bin.

3. Pad ID

: (section, row, column)

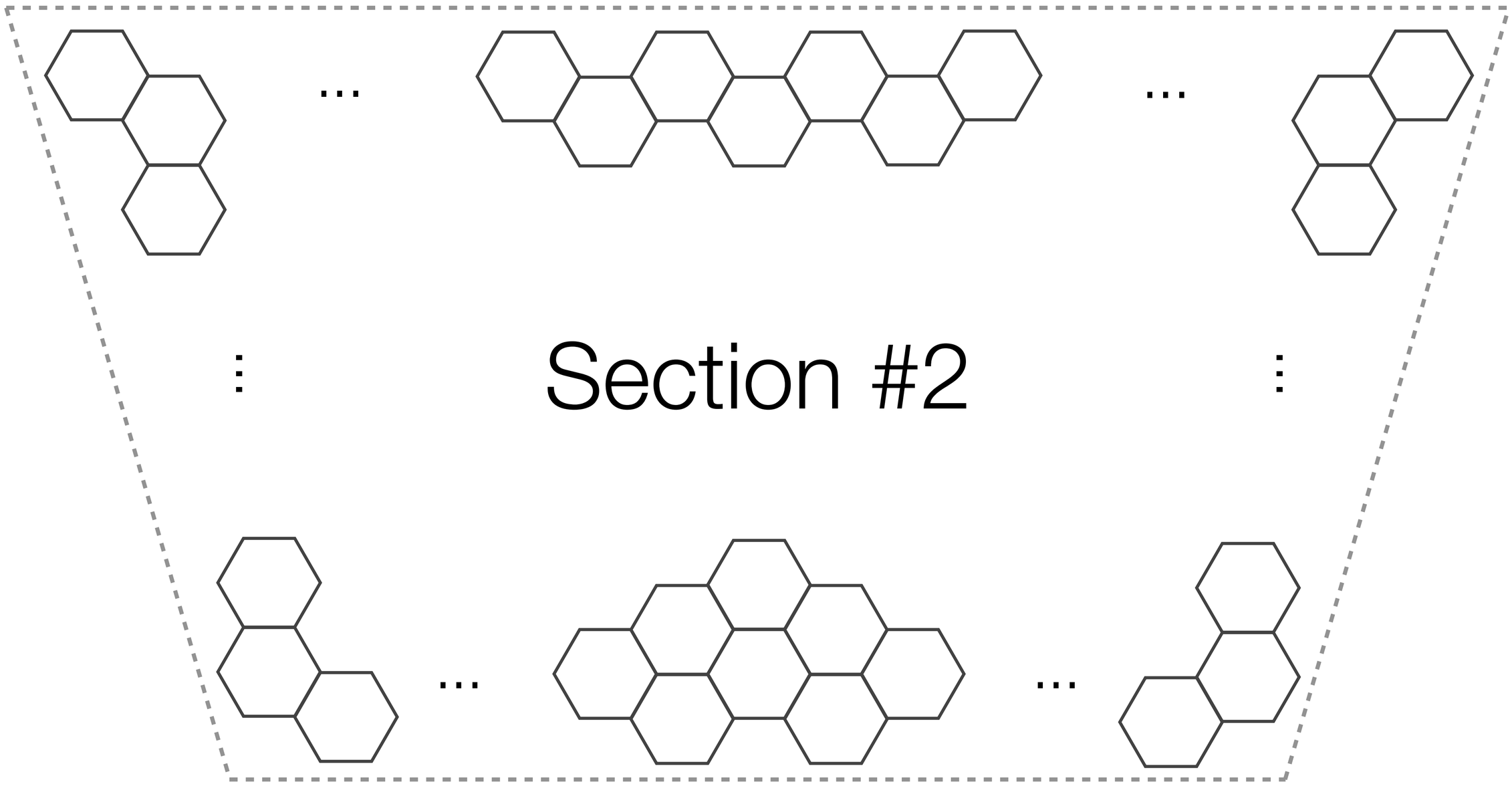
Given by me!

Pad mapping

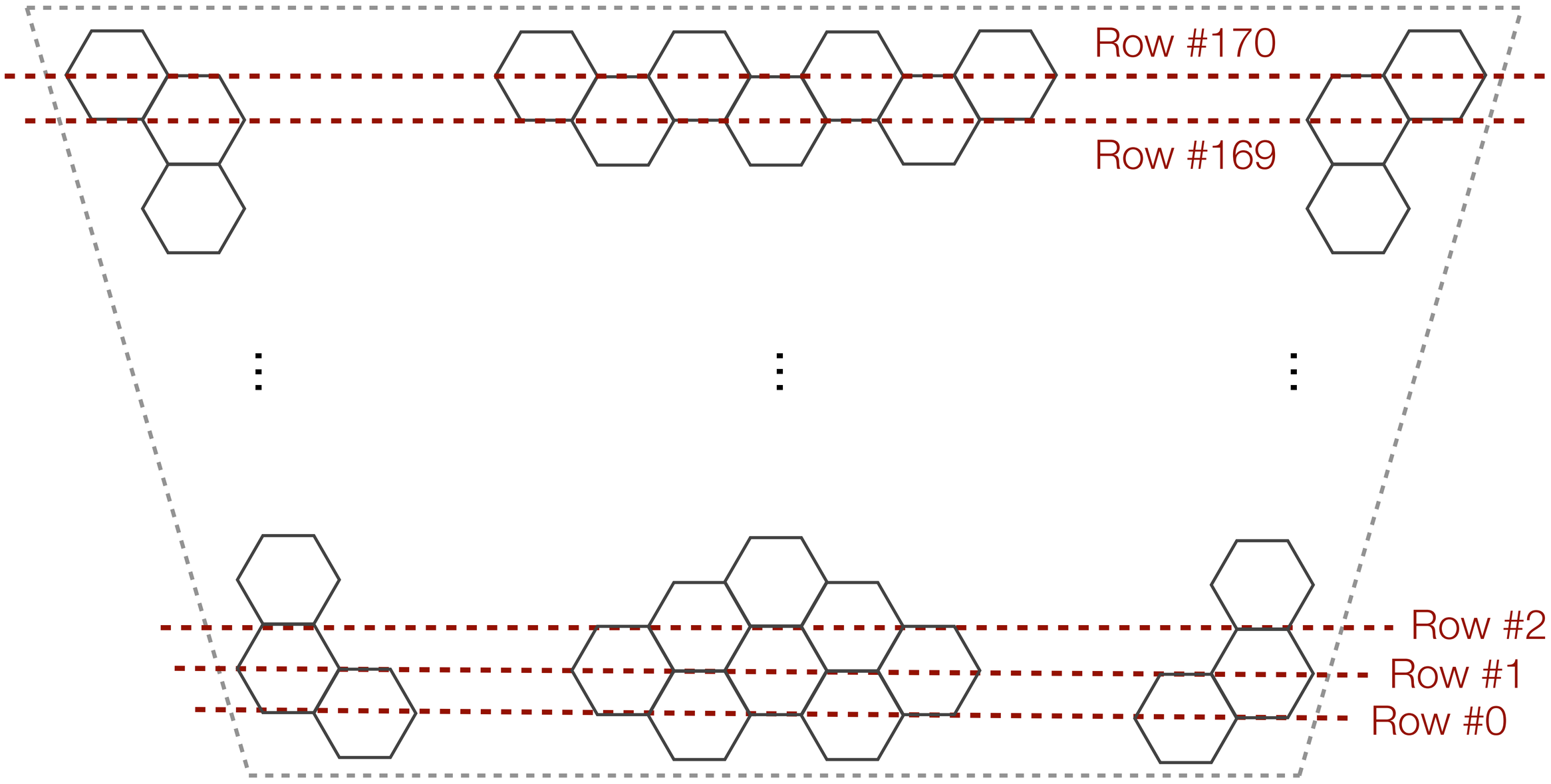


TPC Plane

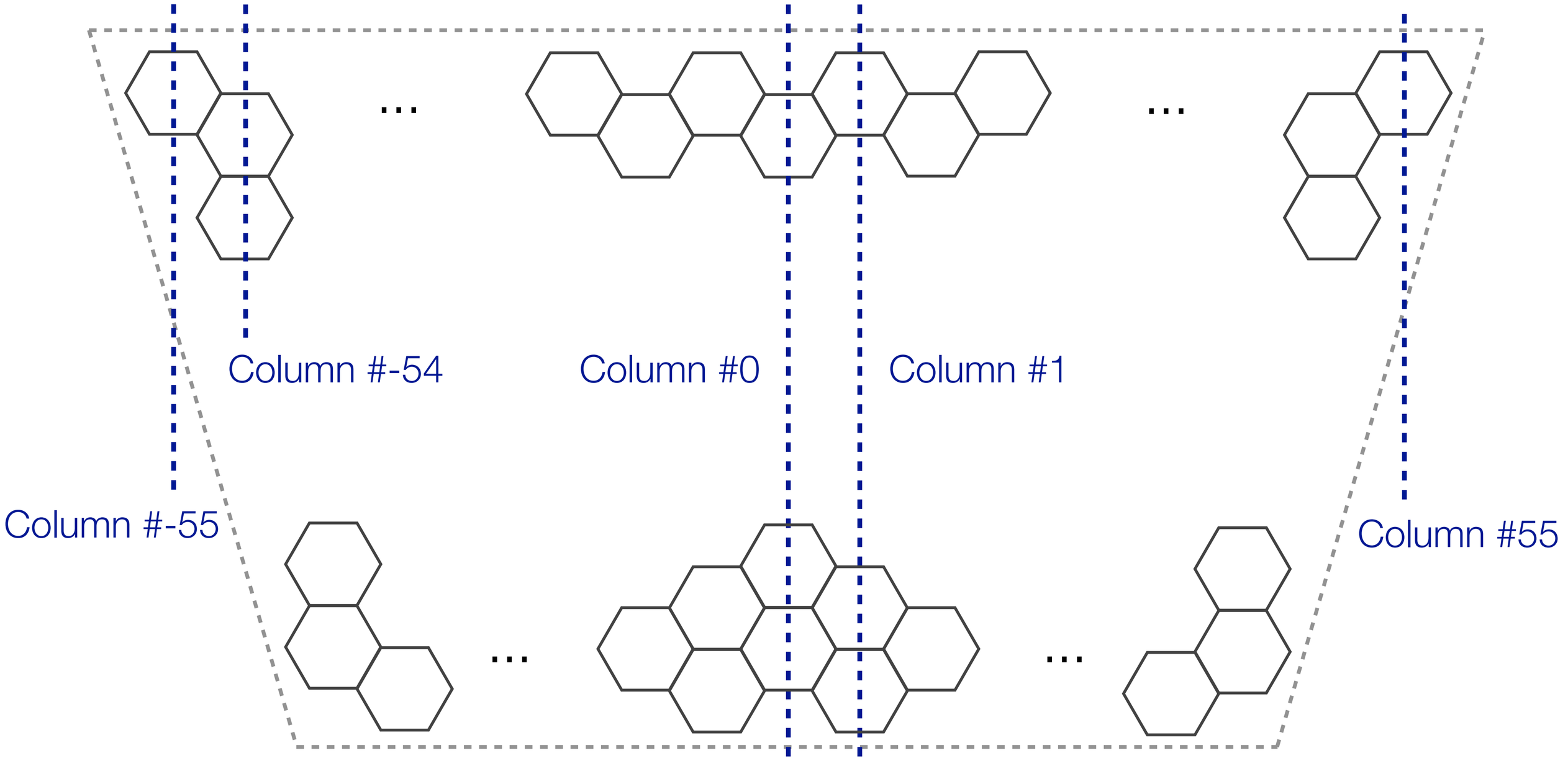
Pad mapping



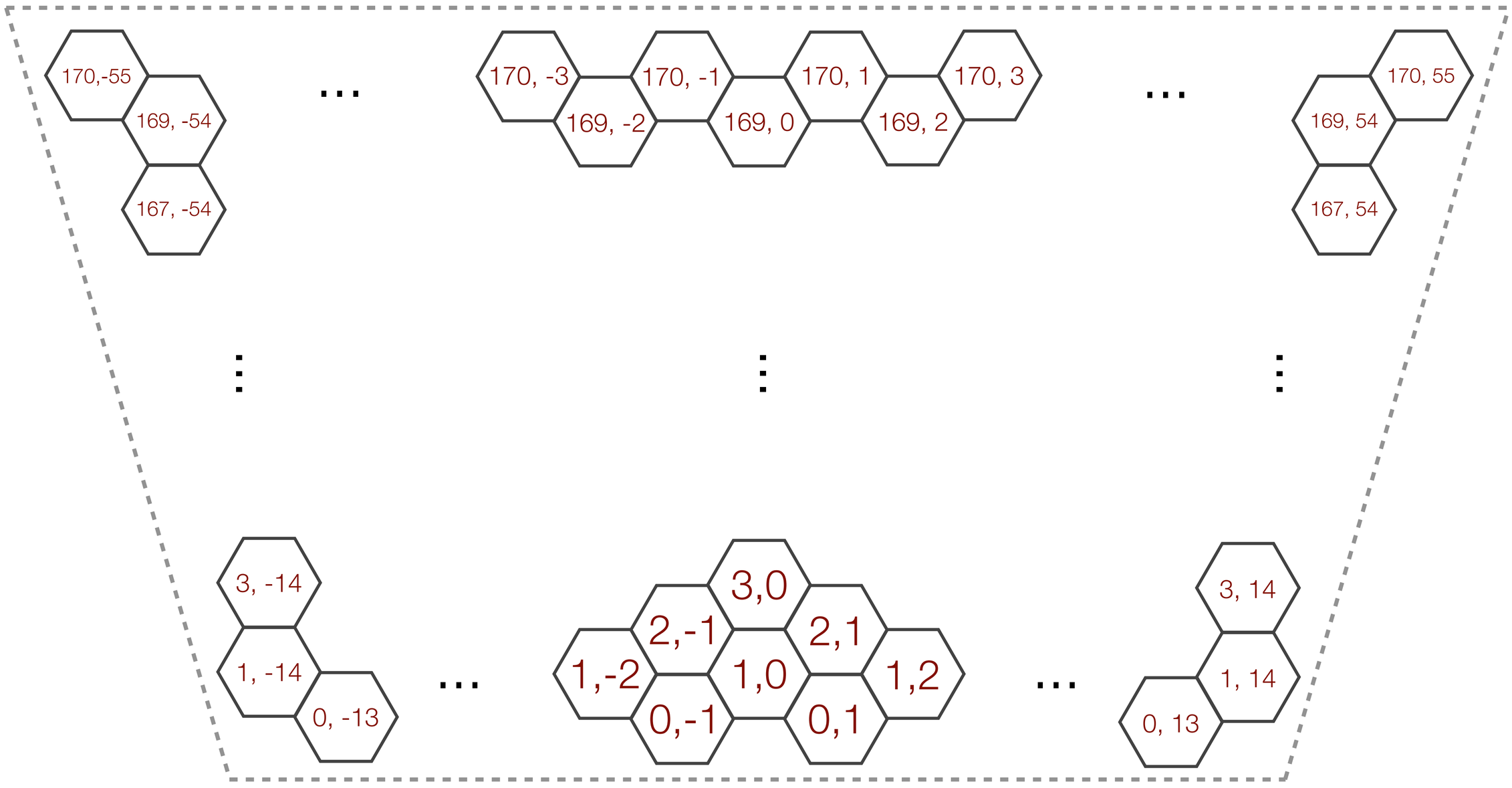
Pad mapping (2.5mm pad)



Pad mapping (2.5mm pad)



Pad mapping (2.5mm pad)



Summary

Pad mapping

↓

Make digitized data file

↓

Clustering in 3D

↓

Kalman Filter

BACK UP

Geant4 simulation

ProductionCutsTable

: Low limit of 250 eV is mostly used for low energy physics.

Charge deposit in a pad

For one hit,

(Energy deposit) / (Mean ionization energy) x (Gem gain)

$= 0.0005 \text{ MeV} / (26.7 \times 10^{-6} \text{ MeV/e}) \times 100^3$

$= 2 \times 10^7$ e

120 fC = 7.5×10^5 e